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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,619	02/05/2001	Motoyuki Hirata	Q62599	8354

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EXAMINER

LORENZO, JERRY A

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

09/775,619

Applicant(s)

HIRATA ET AL.

Examiner

Jerry A. Lorengo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

(1)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 17-22, 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,470,357 to Schmutz et al.

Regarding claims 17 and 18, Schmutz et al. disclose a battery obtained by (column 9, lines 15-37):

- (1) Providing a first solid polymer electrolyte (SPE) film 43;
- (2) Providing a first porous electrode (copper collector grid) 41;
- (3) Contacting and bonding the first SPE film 43 to the first porous electrode 41 to form a first composite electrode;
- (4) Providing a second solid polymer electrolyte (SPE) film 47;
- (5) Providing a second porous electrode (aluminum collector grid) 49;
- (6) Contacting and bonding the second SPE film 47 to the second porous electrode 49 to form a second composite electrode;
- (7) Superposing the first composite electrode on the second composite electrode with an electrolyte/separator element 45 disposed therebetween to form a battery; and
- (8) Impregnating the first and second SPE films 43,47 with an electrolytic solution.

Regarding applicant claims 19 and 20; Schmutz et al. disclose that the first and second SPE films are obtained from a polymerizable compound, i.e., vinylidene fluoride and hexafluoropropylene copolymer, dissolved in a solvent, i.e., acetone (column 4, line 66 to column 5, line 20).

Regarding applicant claims 21 and 22; Schmutz et al. disclose that the SPE films have an ionic conductivity at room temperature of between 2×10^{-3} to 9×10^{-5} S/cm (column 1, lines 62-67; column 5, lines 23 to 63).

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Regarding applicant claims 26 and 27; Schmutz et al. disclose that the SPE films, prior to impregnation with the electrolytic solutions, contain no electrolyte salt (column 2, lines 30-40).

(2)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,470,357 to Schmutz et al.

Schmutz et al., as set forth in section (1), above, disclose the overall battery set forth in claims 30 and 31. In addition, they also disclose that the solid polymer electrolyte (SPE) films of the composite is formed of a mixture, containing (column 6, line 65 to column 7, line 15; and column 9, lines 15-20):

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- 7.0 g of a commercial petroleum coke (ball-milled and sieved through 53 .mu.m),
- 2.0 g of the VdF:HFP copolymer (polymerizable compound)
- 3.12 g dibutyl phthalate,
- 0.37 g Super-P conductive carbon, and about
- 12 g of acetone (solvent)

Thus, as per applicant claims 30 and 31, the SPE films in the composite contain no salt.

They do not, however, specifically disclose, as per applicant claims 30 and 31, that the composite porous electrode with an electrolytic solution has a concentration of an electrolyte salt greater than a concentration at which the electrolytic solution has a maximum conductivity. Nonetheless, the skilled artisan would have appreciated that the ion conductivity would be increased motivated by the fact that Schmutz et al. discloses that introduction of the electrolytic solution into the polymer electrolyte constituent of the porous electrode composite causes it to swell (column 5, lines 23-52). Therefore, it would have a greater concentration than the electrolytic solution has at its maximum conductivity, i.e., at maximum saturation, because the polymer electrolyte is capable of swelling and entraining a higher concentration of electrolyte salt and thus exhibit a concentration and conductivity higher than that achievable by a saturated electrolytic solution alone.

(3)

Claims 23-25, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,470,357 to Schmutz et al. in view of U.S. Patent No. 5,858,264 to Ichino et al.

Regarding applicant claims 23-25, although Schmutz et al. disclose that the SPE film is formed from a polymerizable compound, i.e., vinylidene fluoride and hexafluoropropylene (VdF:HFP) copolymer, dissolved in a solvent, i.e., acetone (column 4, line 66 to column 5, line 20), they do not specifically disclose that the SPE film contains a cross-linking polymer having a urethane bond and an oxyalkylene group.

Regarding applicant claims 32 and 33, although Schmutz et al. disclose that the SPE films are impregnated with an electrolytic solution by immersion, they do not specifically disclose that the SPE film is compounded with an electrolyte salt prior to being polymerized to form the SPE film.

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With regards to applicant claims 23-25, it would have, however, been obvious to one of ordinary skill in the art at the time of invention to substitute the VdF:HFP copolymer disclosed by Schmutz et al. with a cross-linking polymer having a urethane bond and an oxyalkylene group motivated by the fact that Ichino et al., also drawn to methods for the formation of SPE films, discloses that the polymer making up the SPE film may comprise polymers such a vinylidene fluoride or methyl acrylate (a material that has a urethane bond and an oxyalkylene group) and other crosslinking polymers having a crosslinked structure of covalent or ionic bonds (column 4, lines 29-59).

Likewise, with regards to applicant claims 32 and 33, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize a SPE film in the method of Schmutz et al. which is compounded with an electrolyte salt prior to being polymerized to form the SPE film motivated by the fact that Ichino et al. disclose that the introduction of the electrolyte salt into the SPE film either before SPE film formation (by incorporation into the SPE film forming polymer mixture) or after SPE film formation (by immersion in an electrolyte salt solution) are functional expedients well-recognized within the art (column 5, lines 1-22).

(4)

Response to Amendments and Arguments

The amendments and arguments filed January 27, 2004 are acknowledged. In response to the amendments to applicant claims 30 and 31, a modified grounds of rejection has been set forth in section (2), above. Applicant's arguments have been fully considered but they are not persuasive.

The applicant's first argument is that the battery formed by the pressure reduction methodology of the instant invention would have "excellent properties, such as large capacity in comparison to a battery fabricated without pressure reduction", such as the method disclosed by the primary reference to Schmutz et al. The examiner respectfully submits that this may indeed be true.

The instant claims, however, are drawn to a battery, not a method for its manufacture. Thus, "even though product-by-process claims are limited by and defined by the process, *determination of patentability is based on the product itself*. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the

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same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” (emphasis added). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Furthermore, evidence of secondary considerations, such as unexpected results or commercial success, is irrelevant to 35 U.S.C. 102 rejections and thus cannot overcome a rejection so based. Thus, the examiner respectfully submits that the instantly claimed battery is a product-by-process claim and, as set forth in section (1), above, is the same as that disclosed by Schmutz et al. The claim is therefore unpatentable even though the battery of Schmutz et al. is made with a different process, i.e., a battery fabricated without pressure reduction.

The applicant’s next argument is that, contrary to the examiner’s position, “the electrolytic solution does not allow swelling of the polymer electrolyte film and would not result in a higher concentration of electrolyte or higher conductivity.” The examiner respectfully disagrees given the fact that Schmutz et al. disclose that the increase in adsorption capacity is indicative of swelling and that absorption due to swelling is directly proportional to ionic conductivity (column 5, lines 23-63; and specifically; column 56-63). Thus, the examiner respectfully submits that the contention of obviousness set forth in section (2), above, is proper and based on sufficient motivation to render the claims obvious over Schmutz et al.

Finally, the applicant argues that the combination of the Schmutz et al. and Ichino et al. references is improper based only on the argument that “it would have not been obvious to one of ordinary skill in the art to substitute the VdF:HFP copolymer (Schmutz) with a cross-linking polymer having a urethane bond and an oxyalkylene group based on the disclosure of Ichino.” The examiner respectfully disagrees. Firstly, both Schmutz et al. and Ichino et al. are drawn to methods for the formation of SPE films. Secondly, Ichino et al. discloses that the polymer making up the SPE film may comprise polymers such as vinylidene fluoride (such as suggested by Schmutz et al.) or methyl acrylate (a material that has a urethane bond and an oxyalkylene group). Thus, the examiner respectfully submits that the Schmutz et al. and Ichino et al. references have been combined with proper motivation.

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(5)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

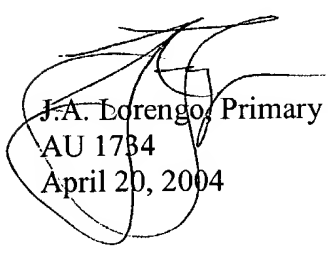
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

(6)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry A. Lorengo whose telephone number is (571) 272-1233. The examiner can normally be reached on Monday through Friday, 8:30 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



J.A. Lorengo, Primary Examiner
AU 1734
April 20, 2004